REMARKS

The present Office Action addresses and rejects claims 1-13. Applicant respectfully requests reconsideration of the present application in view of the amendments set forth above and the remarks below.

Amendments to the Claims

Applicant amends claims 1, 2, and 4-9 to clarify the claim language. No new matter has been added, and support for the amendments can be found throughout the specification and in the drawings.

Rejection Pursuant to 35 U.S.C. §112

On pages 2-4 of the pending Office Action, the Examiner sets forth numerous rejections pursuant to 35 U.S.C. §112, second paragraph. While some of the rejections relate to claim language added by amendment, the majority of the rejections relate to language that was present in the originally filed claims. Since the pending Office Action is a *fourth* Office Action, it is unclear why the Examiner has not yet raised these rejections in the past. Applicant respectfully requests that, in the future, the Examiner avoid any further unnecessary delays in prosecution of the present application and proceed with diligence toward furthering prosecution. To the extent that any additional minor claim amendments may be necessary to place the present application in condition for allowance, Applicant respectfully requests that the Examiner contact Applicant's undersigned representative to resolve these issues.

With regard to the pending rejection, the Examiner rejects claim 1 pursuant to 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement. In particular, the Examiner argues that the step of "positioning a plurality of templates on the facial image" is not described in the specification. Applicant respectfully disagrees. Page 10, line 16 to page 11, line 26 clearly describes a process for outlining features on a facial image using a plurality of templates. While the specification does not specifically recite "positioning a plurality of templates on the facial image," this step is necessarily disclosed in the application as features on the facial image cannot be outlined using the templates without first positioning the templates on the facial image. Moreover, Figure 4 specifically illustrates a plurality of templates positioned on a facial image, thereby

-5-

providing clear support for this limitation in claim 1. Applicant further notes that 35 U.S.C. §112, first paragraph states that the specification "shall contain a written description of the invention . . . to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." The specification of the present application clearly and precisely contains a written description of the invention that is more than sufficient to enable a person to perform the recited step of "positioning a plurality of templates on the facial image." Reconsideration and withdrawal of this objection is respectfully requested.

The Examiner further rejects several limitations present in claims 1, 2, and 4-9 pursuant to 35 U.S.C. §112, second paragraph on the basis that there is insufficient antecedent basis for these limitations. While the Applicant disagrees, claims 1, 2, and 4-9 have been amended, and these amendments are believed to obviate the basis for the Examiner's rejections.

The Examiner also rejects claim 10 pursuant to 35 U.S.C. §112, second paragraph, stating that "Claim 10 recites the limitations 'the group' in line 1. There is insufficient antecedent basis for this limitation in the claim." Claim 10 reads "The method of claim 7, wherein the beauty products are selected from *the group* consisting of . . . ." Applicant refers the Examiner to M.P.E.P 2173.05(h), which states that the phrase "selected from the group consisting of . . . ," which is commonly referred to as a Markush group, is acceptable. Accordingly, this rejection is unfounded and reconsideration and withdrawal is therefore respectfully requested.

Claim Rejections

Independent Claim 1

The Examiner rejects claims 1-5 pursuant to 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,293,284 of Rigg in view of JP 02000011144A to Goto. The Examiner argues that Rigg discloses the claimed method, except for the step of "positioning a plurality of templates on the facial image, each template having a shape that substantially corresponds to a feature on the facial image; enabling a user to adjust the shape of each template to outline features on the facial image." Thus, the Examiner relies on Goto, arguing that Goto discloses a system with a plurality of eyebrow templates for deforming and displaying eyebrows in a facial image, and for correcting the eyebrow templates to outline the eyebrow on the facial image. The Examiner argues that it would have been

obvious at the time of the invention to one skilled in the art to combine the virtual makeover method of Rigg with the eyebrow deformation system of Goto to "help the user to locate different areas on the facial image and as a result applying the virtual makeover faster and easier." Applicant respectfully disagrees.

As discussed in previous responses submitted by the Applicant, Rigg discloses a virtual makeover that utilizes digital scanning software to *electronically* identify those areas of a facial image upon which color cosmetics can be applied. This is achieved by identifying the natural skin color of the person in the facial image, thereby establishing a "color matching facial foundation for building the first stage of a color makeover." (Col. 2, lines 62-63.) The user can then select from a stored set of colors that match the person's skin type, thereby automatically applying lipstick, eye shadow, etc. to areas *electronically identified* by the software program. The disclosed makeover method does not allow the user to select and outline specific facial features, as taught and claimed by the present invention.

Goto, a translated copy of which is attached hereto, discloses an image processing technique for correcting eyebrows in a facial image. Like Rigg, Goto's technique is performed *electronically*. An image is scanned into the computer, and *the computer processes the image* to determine the location of the eyebrows, using other reference points on the face, and to eliminate and replace the natural eyebrows using an eyebrow template. Goto does not teach or even suggest "enabling a user to adjust the points of the plurality of templates to specify features on the facial image," as required by independent claim 1. Accordingly, neither Goto nor Rigg, taken alone or combined, teach or even suggest the present invention.

Applicant further notes that a person having ordinary skill in the art at the time of the invention would not have modified the virtual makeover of Rigg to include any type of template for highlighting features because Rigg already provides a makeover method that *electronically* identifies areas on the face and applies makeup to those areas. The use of any type of template to outline features on a facial image would actually *diminish* Rigg's current makeover method, as the templates would likely be less accurate and slower than the current electronic identification system disclosed by Rigg.

Accordingly, independent claim 1 distinguishes over Rigg and Goto, taken alone or combined, and therefore claim 1 represents allowable subject matter. Claims 2-5 are allowable at least because they depend from an allowable base claim.

Independent Claim 6

The Examiner rejects claims 6 pursuant to 35 U.S.C. §102(b) as being anticipated by Goto. Remaining dependent claims 7-13 are rejected pursuant to 35 U.S.C. §103(a) as being obvious over Goto in view of Rigg.
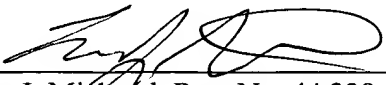
Independent claim 6 requires the step of "enabling the user to move one or more of the plurality of points selected so as to form a new shape outlining one or more features in the digital photographic image." Accordingly, for the same reasons stated above, independent claim 6 distinguishes over Goto and Rigg, taken alone or combined, and therefore represents allowable subject matter.

Conclusion

In view of the amendments and remarks above, Applicant submits that claims 1-13 are in condition for allowance. Applicant strongly encourages the Examiner to telephone the undersigned in the event that such communication might expedite prosecution of this matter.

Respectfully submitted,

Date: October 20, 2004

Lisa J. Michaud, Reg. No. 44,238
Attorney for Applicant(s)

NUTTER, McCLENNEN & FISH, LLP
World Trade Center West
155 Seaport Boulevard
Boston, MA 02210
Tel: (617)439-2550
Fax: (617)310-9550

1370373.1

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to an eyebrows deformation system, and relates to the eyebrows deformation system which deforms and displays the eyebrows in people's face image.
[0002]
[Description of the Prior Art] The dramatic interpretation of the image by the makeup is a thing adapting the molding theory, and when reflected in the formal description and a formal eye, it grasps what kind of impression is received how. For example, a straight line makes Sharp or a static image direct, and a curve directs software or a dynamic image. Therefore, by making up eyebrows linearly or rounded, a sharp image can be directed, respectively or a soft image can be directed. Similarly the image fallen and attached using downhill course can be taken out, or a brawny image can be directed using a thick line.
[0003] It considers realizing image production by such makeup using the image processing technique of a computer system. In the image processing technique of the conventional computer system, making a configuration only deform linearly or rounded is performed.
[0004]
[Problem(s) to be Solved by the Invention] However, in the image processing technique of the conventional computer system, the operator had to input finely assignment of the part of the eyebrows in a face image, actuation of deformation, correction of the color for a variant part, etc., and the special knowledge of an image processing was needed for actuation, and there was a problem of taking time and effort and time amount.
[0005] This invention was made in view of the above-mentioned point, is easy to operate it for deforming and displaying the eyebrows in a face image, does not require time amount, but aims at offering the eyebrows deformation system which can express natural eyebrows.
[0006]
[Means for Solving the Problem] In the eyebrows deformation system which deforms invention according to claim 1 for the eyebrows in a face image, and is displayed An eyebrows template storing means by which two or more eyebrows templates showing the configuration of eyebrows are stored beforehand, It has an eyebrows template correction means to correct the eyebrows template chosen from said two or more eyebrows templates according to said face image, an elimination means to eliminate eyebrows from said face image, and a synthetic means to compound said corrected eyebrows template in the face image which eliminated said eyebrows.
[0007] Thus, by compounding the eyebrows template which prepares two or more eyebrows templates showing the configuration of eyebrows, corrected the eyebrows template chosen from them according to the face image, and eliminated eyebrows from the face image and was corrected, by the easy actuation which chooses a desired eyebrows template, eyebrows can be deformed without spending many hours and natural eyebrows can be displayed.
[0008] Invention according to claim 2 determines the arrangement location of the head of the brow of said selected eyebrows template, and each tip of an eyebrow in an eyebrows deformation system

according to claim 1 according to the nose of a face image, and the configuration of an eye, and said eyebrows template correction means corrects said eyebrows template. Thus, since the arrangement location of the head of the brow of the eyebrows template chosen according to the nose of a face image and the configuration of an eye and each tip of an eyebrow is determined, an eyebrows template is compoundable in a natural form.

[0009] Invention according to claim 3 compounds the pixel near the eyebrows of said face image in an eyebrows deformation system according to claim 1 or 2 into the part from which said elimination means eliminates the eyebrows of a face image. Thus, since the part which eliminated eyebrows becomes beige even if there is a difference in the configuration of the eyebrows to eliminate and the eyebrows template to compound, in order to compound the pixel near the eyebrows into the part which eliminates eyebrows, it can prevent that a blemish arises in the compounded face image.

[0010] Invention according to claim 4 has the 1st smoothing means which performs smoothing about the boundary of the part which eliminated eyebrows with said elimination means in an eyebrows deformation system according to claim 3. Thus, since MUJINGU of the boundary of the part which eliminated eyebrows is performed, the quality of the face image which a boundary stops having been conspicuous and was compounded can be improved.

[0011] invention according to claim 5 -- claim 1 thru/or either of 4 -- the eyebrows deformation system of a publication -- setting -- It has the 2nd smoothing means which performs smoothing about the edge of the eyebrows in the face image which compounded the eyebrows template with said synthetic means. Thus, since MUJINGU is performed about the edge of the eyebrows in the compound face image, the quality of the face image which the boundary of the compounded eyebrows stops having been conspicuous and was compounded can be improved.

[0012]

[Embodiment of the Invention] Drawing 1 shows the block diagram of one example of the eyebrows deformation system of this invention. the inside of this drawing, and a central processing unit (CPU) 10 -- a bus 15 -- minding -- an input unit 20, storage 30, a display 40, an airline printer 50, and a communication device 60 -- each is connected. As an input device 20, the keyboard 21, the mouse 22, and the digital camera (or CCD camera) 23 grade are prepared, and RAM31, ROM32, the hard disk drive unit 33, and the flexible disk equipment 34 grade are prepared as a store 30. CPU10 is displayed on a display 40, and is printed and outputted with an airline printer 50 while it performs the various processing programs memorized by storage 30 and memorizes the result to storage 30. Two or more kinds of eyebrows templates showing the configuration of eyebrows other than various processing programs are beforehand stored in storage 30.

[0013] Drawing 2 shows the Maine flow chart of one example of the eyebrows deformation system of this invention. Among this drawing, by focus extract processing of step S10, a test subject's face is picturized and the focus of the obtained face image is extracted. Next, the configuration of the eyebrows of the request which is going to deform at step S12 is chosen using a mouse 22 from two or more eyebrows templates displayed on the display 40.

[0014] Then, the left eyebrow of the eyebrows template which eliminated the original left eyebrow of a face image at step S14, and was chosen at step S16 is compounded in a face image. Furthermore, the right eyebrow of the eyebrows template which eliminated the original right eyebrow of a face image at step S18, and was chosen at step S20 is compounded in a face image. At step S22, while displaying the face image which compounded eyebrows on a display 40, it prints out with an airline printer 50.

[0015] Drawing 3 shows the flow chart of one example of the focus extract processing performed at step S10. A test subject's face is picturized with the digital camera 23 of an input device 20 at step S30 among this drawing, and the obtained face image is memorized to the hard disk drive unit 33 of a store 30. Next, face location recognition processing is performed to the above-mentioned face image at step S32. While labeling of a face field is performed by this face location recognition processing, the focus of the profile of a face is extracted. In addition, a face image expresses a location with XY coordinate to which the X-axis is set as a longitudinal direction and it sets a Y-axis as a lengthwise direction by making an upper left corner into a zero.

[0016] Next, edge image creation processing of a face field is performed at step S34, and Y projection which the edge image (binary image) of a face is created, and projects the above-mentioned edge image on a Y-axis at step S36, and creates the histogram of an edge is performed. Then, the Y coordinate of about each part of a face, i.e., eyebrows, an eye, a nose, and each opening is searched with step S38 from the histogram by Y projection.

[0017] At step S40, the focus which accompanies the focus of an eye and a nose and this is extracted in the Y coordinate location containing the eye and nose in an edge image of a face. Moreover, the focus which accompanies the focus of opening and this is extracted in the Y coordinate location which contains opening in the edge image of a face at step S42. Moreover, the focus which accompanies the focus of eyebrows and this is extracted, and processing is ended in the Y coordinate location which contains the eyebrows in the edge image of a face at step S44.

[0018] Here, the extract of the focus of the eye and nose which are used for deformation of eyebrows, and eyebrows is explained in detail. Drawing 4 shows the flow chart of one example of focus extract processing of the eye performed at step S40, and a nose. At step S46, the face image of the Y coordinate field containing an eye and a nose is acquired among this drawing. The sequential increment of the threshold TH is carried out from the minimum value by loop-formation processing of the following step S47, and binary-ization of a face image is performed using a threshold TH at step S48 within a loop formation. Thus, adjustable [of the threshold TH] is carried out and binary-ization is performed for detecting a pupil correctly.

[0019] At the following step S49, labeling of the field surrounded with a continuous edge is carried out in the edge image obtained by binary-ization. And it distinguishes whether it is a pupil about each field by which labeling was carried out at step S51 in loop-formation processing of step S50. Here, the field is almost circular, and there is same field which serves as a pair to the field with the area of the predetermined range, or it distinguishes whether it is a pupil on condition that **.

[0020] Next, it distinguishes whether two pupils were detectable at step S52, and when a pupil is able to be detected, binary-ization (edge image) of a face image is performed using the threshold of a fixed value at step S54. Then, the focus of a left eye is extracted by step S56 in the field of the left eye centering on the pupil on the left of an edge image, and the focus of a right eye is extracted by step S58 in the field of the right eye centering on the pupil on the right of an edge image. In addition, it is the profiles EL5, ER5, EL3, and ER3 of the pupils PL and PR shown in drawing 5 as the focus of an eye on either side, outer canthi EL1 and ER1, eye's inner corners EL4 and ER4, and the eye of the upper and lower sides of a pupil, and these focus is memorized.

[0021] Then, it progresses to step S60. Here, two pupils are made into two points and the equilateral triangle which established one point in the direction of opening is set up. And at step S62, in the above-mentioned equilateral triangle in an edge image, the point that Y coordinate is the largest is extracted as the focus N2, and is memorized. Next, at step S64, between the focus EL3 and ER3 and the focus N2, the point that X coordinate is the smallest is extracted as the focus N1, and is memorized, and Y coordinate extracts the point that X coordinate is the largest, as the focus N3, and memorizes it. All of the above-mentioned eye and the focus of a nose are extracted, and this processing is ended.

[0022] Drawing 6 and drawing 7 show the flow chart of one example of focus extract processing of the eyebrows performed at step S44. At step S100, it distinguishes whether the Y coordinate of eyebrows is proper among drawing 6 . Here, when the Y coordinate of eyebrows is smaller than the average of the Y coordinate of the focus F1 and C2 of a face, it distinguishes that it is proper, for example. If the Y coordinate of eyebrows is not proper here, let this be a proper value at step S102.

[0023] At the following step S102, carry out the variation rate of the X coordinate from the inside of the eyebrows of the left in a face field to an outside, and loop-formation processing is performed. The variation rate of the Y coordinate is made to carry out in the direction of a lower limit from the upper limit of the field of eyebrows at step S104 within this loop formation, and loop-formation processing is performed, and at step S106 within this loop formation, from the edge image of a face, it is an edge, and when the pixel which is not beige is first detected from a face image, it progresses to step S108. At step S108, the Y coordinate of the detected pixel is memorized as upper limit of the left eyebrow in the X

coordinate at this time. Furthermore, the variation rate of the Y coordinate is made to carry out in the direction of upper limit from the lower limit of the field of eyebrows at step S110 within the loop formation of step S102, loop-formation processing is performed, and at step S112 within this loop formation, from the edge image of a face, it is an edge, and when the pixel which is not beige is first detected from a face image, the Y coordinate of the pixel detected at step S114 is memorized as a lower limit of the left eyebrow in the X coordinate at this time.

[0024] At step S122 of following drawing 7 , carry out the variation rate of the X coordinate from the inside of the eyebrows of the right in a face field to an outside, and loop-formation processing is performed. The variation rate of the Y coordinate is made to carry out in the direction of a lower limit from the upper limit of the field of eyebrows at step S124 within this loop formation, and loop-formation processing is performed, and at step S126 within this loop formation, from the edge image of a face, it is an edge, and when the pixel which is not beige is first detected from a face image, it progresses to step S128. At step S128, the Y coordinate of the detected pixel is memorized as upper limit of the right eyebrow in the X coordinate at this time. Furthermore, the variation rate of the Y coordinate is made to carry out in the direction of upper limit from the lower limit of the field of eyebrows at step S130 within the loop formation of step S122, loop-formation processing is performed, and at step S132 within this loop formation, from the edge image of a face, it is an edge, and when the pixel which is not beige is first detected from a face image, the Y coordinate of the pixel detected at step S134 is memorized as a lower limit of the right eyebrow in the X coordinate at this time.

[0025] Then, the highest location (Y coordinate min) among the upper limit of each eyebrows on either side is extracted at step S144 as the focus (points BL2 and BR2 shown in drawing 5) of ****. Moreover, the location inside a face (core side) is most extracted at step S146 in each upper limit and lower limit of eyebrows on either side as the focus (points BL3 and BR3 shown in drawing 5) of a head of the brow. Moreover, the location of the outside of a face is most extracted at step S148 in each upper limit and lower limit of eyebrows on either side as the focus (points BL1 and BR1 shown in drawing 5) of the tip of an eyebrow. Moreover, the lowest location (Y coordinate max) in the lower limit of each eyebrows on either side is extracted at step S149 as the focus (points BL4 and BR4 shown in drawing 5) of ****. And this processing is ended.

[0026] Drawing 8 shows the flow chart of one example of elimination processing of the eyebrows performed at steps S14 and S18. The mask of the part for an eyebrow part (part surrounded by the edge image of eyebrows) is carried out among this drawing among the fields (eyebrows field) which contain the eyebrows of a face image at step S160, and the color information on eyebrows is memorized at this time. Next, the variation rate of the Y coordinate is made to carry out in the direction of a lower limit from the upper limit of the eyebrows of a face image at step S162, loop-formation processing is performed, the variation rate of the X coordinate is carried out from the inside of eyebrows to an outside at step S164 within this loop formation, and loop-formation processing is performed. It distinguishes whether XY coordinate is a mask part at step S166 within this loop formation, and in hitting a mask part, it progresses to step S168.

[0027] At step S168, the pixel which chose the beige pixel as an object for a copy at random, and was chosen from the outside circumference location of a mask part at step S170 among eyebrows fields is copied to the pixel of XY coordinate of the above-mentioned mask part. Flesh color is compounded by the part of eyebrows and eyebrows are eliminated by this. Then, median filter processing is performed about the elimination part of eyebrows at step S172, a noise is removed and smoothing near the edge (based on an edge image) of the eyebrows of a face image is performed at step S174. Furthermore, smoothing near [which was eliminated at step S176] the head of the brow is performed, and processing is ended. Thus, since MUJINGU of the boundary of the part which eliminated eyebrows is performed, the quality of the face image which a boundary stops having been conspicuous and was compounded can be improved.

[0028] Drawing 9 shows the flow chart of one example of synthetic processing of the eyebrows performed at steps S16 and S20. Among this drawing, the inclination of eyebrows is computed from the focus (a right eyebrow BR3, BR1) of the head of the brow extracted at step S180, and the tip of an

eyebrow, and an eyebrows template is rotated so that it may become the inclination of the eyebrows which carried out [above-mentioned] calculation of the inclination of the selected eyebrows template. The color of an eyebrows template is changed into the color of the eyebrows of the origin memorized at the time of elimination of eyebrows at the following step S182.

[0029] And at step S184, as shown in drawing 10 (A), the intersection of the straight line L1 which passes along the focus N3 of microrhinia and the focus ER4 of an eye's inner corner, and the Y coordinate (straight line L2) of the focus BR 3 of the original eyebrows is set up as a head of the brow TBR3 of an eyebrows template. Furthermore, as shown in drawing 10 (B), the intersection of the straight line L3 which passes along the focus N3 of microrhinia and the focus ER1 of an outer canthus, and the straight line L4 which passes along the head of the brow and the tip of an eyebrow of the eyebrows template which rotated is set up as the tip of an eyebrow TBR1 of a template. Then, the eyebrows template which rotated so that the head of the brow of the eyebrows template which rotated at step S186, and the tip of an eyebrow might be in agreement with a head of the brow TBR3 and the tip of an eyebrow TBR1 is expanded or reduced, and size doubling is performed. Thus, since the arrangement location of the head of the brow of the eyebrows template chosen according to the nose of a face image and the configuration of an eye and each tip of an eyebrow is determined, an eyebrows template is compoundable in a natural form.

[0030] Next, the variation rate of the Y coordinate is made to carry out in the direction of a lower limit from the upper limit of the eyebrows of a face image at step S188, loop-formation processing is performed, the variation rate of the X coordinate is carried out from the inside of eyebrows to an outside at step S190 within this loop formation, and loop-formation processing is performed. Carrying out linear interpolation of the eyebrows template at step S192 within this loop formation, it copies to a face image and eyebrows are compounded. Then, the variation rate of the Y coordinate is made to carry out in the direction of a lower limit from the upper limit of the eyebrows of a face image at step S194, loop-formation processing is performed, the variation rate of the X coordinate is carried out from the inside of eyebrows to an outside at step S196 within this loop formation, and loop-formation processing is performed. Edge detection is performed at step S198 within this loop formation, and it distinguishes whether it is an edge at step S200. And if it is an edge, it will progress to step S202, smoothing is performed using 9 pixels which adjoins the XY coordinate, the compound eyebrows are familiarized with a face image and a natural expression is obtained.

[0031] Thus, by compounding the eyebrows template which prepares two or more eyebrows templates showing the configuration of eyebrows, corrected the eyebrows template chosen from them according to the face image, and eliminated eyebrows from the face image and was corrected, by the easy actuation which chooses a desired eyebrows template, eyebrows can be deformed without spending many hours and natural eyebrows can be displayed. Moreover, since MUJINGU is performed about the edge of the eyebrows in the compound face image, it prevents that the boundary of the compounded eyebrows is unnaturally conspicuous, and the quality of the compounded face image can be improved.

[0032] In addition, storage 30 corresponds to an eyebrows template storing means, step S180-186 correspond to an eyebrows template correction means, step S160-170 correspond to an elimination means, step S153 corresponds to a synthetic means, step S172-176 correspond to the 1st smoothing means, and step S202 corresponds to the 2nd smoothing means.

[0033]

[Effect of the Invention] As mentioned above, invention according to claim 1 has an eyebrows template storing means to by_which two or more eyebrows templates showing the configuration of eyebrows are stored beforehand, an eyebrows template correction means correct the eyebrows template chosen from said two or more eyebrows templates according to said face image, an elimination means eliminate eyebrows from said face image, and a synthetic means compound said corrected eyebrows template in the face image which eliminated said eyebrows.

[0034] Thus, by compounding the eyebrows template which prepares two or more eyebrows templates showing the configuration of eyebrows, corrected the eyebrows template chosen from them according to the face image, and eliminated eyebrows from the face image and was corrected, by the easy actuation

which chooses a desired eyebrows template, eyebrows can be deformed without spending many hours and natural eyebrows can be displayed.

[0035] Moreover, in invention according to claim 2, an eyebrows template correction means determines the arrangement location of the head of the brow of said selected eyebrows template, and each tip of an eyebrow according to the nose of a face image, and the configuration of an eye, and corrects said eyebrows template. Thus, since the arrangement location of the head of the brow of the eyebrows template chosen according to the nose of a face image and the configuration of an eye and each tip of an eyebrow is determined, an eyebrows template is compoundable in a natural form.

[0036] Moreover, in invention according to claim 3, an elimination means compounds the pixel near the eyebrows of said face image into the part which eliminates the eyebrows of a face image. Thus, since the part which eliminated eyebrows becomes beige even if there is a difference in the configuration of the -eyebrows to eliminate and the eyebrows template to compound, in order to compound the pixel near the eyebrows into the part which eliminates eyebrows, it can prevent that a blemish arises in the compounded face image.

[0037] Moreover, invention according to claim 4 has the 1st smoothing means which performs smoothing about the boundary of the part which eliminated eyebrows with the elimination means. Thus, since MUJINGU of the boundary of the part which eliminated eyebrows is performed, the quality of the face image which a boundary stops having been conspicuous and was compounded can be improved. Moreover, invention according to claim 5 has the 2nd smoothing means which performs smoothing about the edge of the eyebrows in the face image which compounded the eyebrows template with the synthetic means.

[0038] Thus, since MUJINGU is performed about the edge of the eyebrows in the compound face image, the quality of the face image which the boundary of the compounded eyebrows stops having been conspicuous and was compounded can be improved.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original
precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] An eyebrows template storing means by which two or more eyebrows templates showing the
configuration of eyebrows are beforehand stored in the eyebrows deformation system which deforms
and displays the eyebrows in a face image, An eyebrows template correction means to correct the
eyebrows template chosen from said two or more eyebrows templates according to said face image, The
eyebrows deformation system characterized by having an elimination means to eliminate eyebrows from
said face image, and a synthetic means to compound said corrected eyebrows template in the face image
which eliminated said eyebrows.
[Claim 2] It is the eyebrows deformation system characterized by for said eyebrows template correction
means determining the arrangement location of the head of the brow of said selected eyebrows template,
and each tip of an eyebrow in an eyebrows deformation system according to claim 1 according to the
nose of a face image, and the configuration of an eye, and correcting said eyebrows template.
[Claim 3] It is the eyebrows deformation system characterized by compounding the pixel near the
eyebrows of said face image into the part from which said elimination means eliminates the eyebrows of
a face image in an eyebrows deformation system according to claim 1 or 2.
[Claim 4] The eyebrows deformation system characterized by having the 1st smoothing means which
performs smoothing in an eyebrows deformation system according to claim 3 about the boundary of the
part which eliminated eyebrows with said elimination means.
[Claim 5] claim 1 thru/or either of 4 -- the eyebrows deformation system characterized by having the
2nd smoothing means which performs smoothing in the eyebrows deformation system of a publication
about the edge of the eyebrows in the face image which compounded the eyebrows template with said
synthetic means.

[Translation done.]